

(3 Hours)

[Total Marks: 80]

- NB : 1) **Question 1** is **compulsory**.
2) Attempt any **three** questions from the **remaining** questions.
3) **Assume** suitable **data** wherever applicable.
4) **Draw figures** wherever applicable.

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| 1 (a) | Explain different applications of computer graphics. | 5 |
| (b) | Explain different types of virtual reality systems. | 5 |
| (c) | Prove that two successive rotation are additive. | 5 |
| (d) | Explain fractals | 5 |
| 2 (a) | Explain Virtual reality architecture. | 10 |
| (b) | Explain Bresenham's line drawing algorithm. Explain how it is different from DDA | 10 |
| 3 (a) | Find the Bézier curve given 4 control points (25,25), (45,40), (60,45) and (90,10) using the step size as 0.1. | 10 |
| (b) | List various polygon filling algorithms and explain boundary fill in detail. | 10 |
| 4 (a) | Explain geometric and kinematic modeling in detail | 10 |
| (b) | Explain Sutherland Hodgeman polygon clipping algorithm. | 10 |
| 5 (a) | Explain 3D transformations with suitable example for each. | 10 |
| (b) | Explain Liang Barsky line clipping algorithm with example. | 10 |
| 6 | Write short note on (any four) | 20 |
| (a) | Antialiasing techniques | |
| (b) | Application of Virtual Reality | |
| (c) | Text Clipping | |
| (d) | VR toolkit | |
| (e) | Morphing techniques | |